Paper No. 13

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte K. R. UDAYAKUMAR, HOWARD R. BERATAN,
and CHARLES M. HANSON

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Appeal No. 2002-1205
Application No. 09/422,380

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ON BRIEF

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Before OWENS, WALTZ and PAWLIKOWSKI, **Administrative Patent Judges**.
PAWLIKOWSKI, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1-7, which are all of the claims pending in this application. A copy of each of these claims is set forth in the attached Appendix.

Claims 2-5 and 7 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

Claims 1 and 2 stand rejected under 35 U.S.C. § 103 as being unpatentable over Yamanaka in view of Akashi.

Claim 6 stands objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claim. Answer, page 2.

The examiner relies upon the following references as evidence of unpatentability:

Akashi et al. (Akashi)	3,481,875	Dec. 2, 1969
Yamanaka* (Kokai Japanese Patent Publication)	JP 04-1600035	Jun. 3, 1992

(*We rely on the English translation provided in Paper No. 12, translated by Schreiber Translations, Inc.)

OPINION

I. The 35 U.S.C. § 112 second paragraph rejection

As a preliminary matter, we observe that on page 2 of the specification, the examiner has indicated that the 35 U.S.C. §112 rejection of claims 1 and 6 has been withdrawn because of the proposed changes to Figure 4 (the proposed changes to Figure 4 appear in the amendment of Paper No. 6 (i.e., amendment filed on February 26, 2001)). Upon return of this application to the jurisdiction of the examiner, appellants must submit a formal drawing having the proposed changes therein for proper entry of such drawing.

With regard to claims 2, 4, 5, and 7, the examiner states that x and y are indefinite because x and y are not defined.

We note that during patent examination, the pending claims must be interpreted as broadly as their terms reasonably allow. In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 320, 322 (Fed. Cir. 1999). In determining the patentability of claims, the PTO gives claim language its "broadest reasonable interpretation" consistent with the specification and claims. In re Morris, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997)(citations omitted).

In the present case, Figure 4, which is part of the original disclosure, shows values for x and y. Also, values for x and y are set forth on pages 5-9 of appellants' specification. The qualifying equation recited in claim 2, for example, is therefore understood in light of these values set forth in figure 4 and on pages 5-9 of the specification. We therefore reverse the rejection with respect to claims 2 and 7.

However, the compound formula set forth in claim 4 (from which claim 5 depends) does not contain a qualifying equation (a preferred embodiment). Because x and y can have values more broad than in claim 2, and more broad than the embodiments disclosed in appellants' specification, we cannot ascertain what values of x and y would not result in appellants' invention. Appellants' specification is silent about when x and y have values other than the more limited values represented in figure 4 and disclosed on pages 5-9. For this reason, we affirm the rejection of claims 4-5.

The examiner also rejects claim 3, stating that it is indefinite because of the phrase "about 0." We disagree for the following reasons.

Claim 3 recites "with x in the range of about 0 to 0.1." This recitation encompasses both situations discussed by the examiner on page 4 of the answer. It does not have to address one situation or the other. Therefore, we determine that claim 3 is not indefinite.

In view of the above, we therefore reverse the 35 U.S.C. § 112, second paragraph, rejection, with respect to claims 2, 3, and 7, but we affirm the rejection with respect to claims 4 and 5.

II. The 35 U.S.C. § 103 rejection

Critical to resolving this issue is a determination of whether either Yamanaka or Akashi discloses a ferroelectric material because appellants' claims are directed to a ferroelectric material, and a method of fabrication of a ferroelectric material.

In the 35 U.S.C. § 103 rejection, the examiner relies upon the theory of inherency to meet the aspect of appellants' claims regarding a ferroelectric material or a method of making the same. Answer, pages 4 and 5-6.

We note that when an examiner relies upon a theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied art. Ex Parte Levy, 17 USQP2d 1461, 1464 (Bd. Pat. App. & Int. 1990). Inherency "may not be established by probabilities or possibilities." The mere fact that a certain thing may result from a given set of circumstances is not sufficient. Ex Parte Skinner, 2 USPQ2d 1788, 1789 (Bd. Pat. App. & Int. 1986). Also, the examiner has the initial burden of providing such evidence or technical reasons. See In re Spada, 911 F.2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990).

In the present case, on pages 5 and 6 of the answer, the examiner states that because Yamanaka discloses a sealing composition that includes a lead titanate powder having the specified formula, "[t]he taught titanate is a ferroelectric material." Yet, the examiner does not provide evidence or technical reasoning in support thereof.

We have carefully reviewed the English translation of Yamanaka. We observe that on page 9 of the English translation, a discussion of how the samples, shown in Table 2, are made, is set forth.

The process for making the samples in Table 2 includes mixing certain raw materials, baking them at from 1100 to 1350°C for a period of five hours, followed by crushing and passing the material through a screen to achieve a particular particle diameter.

The annealing conditions used in making the ferroelectric material according to appellants' invention is set forth on pages 5-7 of appellants' specification. The temperature ranges are from 475°C to as high as 700°C, and the period of time at which the material is annealed ranges from 10 seconds to 60 minutes. This is in stark contrast to the aforementioned temperature and time ranges set forth on page 9 of the English translation of Yamanaka.

The examiner has not explained why, in view of this contrast, Yamanaka supports the examiner's theory of inherency. The examiner also does not explain how Akashi cures this deficiency in Yamanaka.

In view of the above, we therefore reverse the 35 U.S.C. § 103 of rejection of claims 1 and 2.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART

TERRY J. OWENS Administrative Patent Judge	)
THOMAS A. WALTZ Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND) INTERFERENCES
BEVERLY A. PAWLIKOWSKI Administrative Patent Judge	)

BAP/sld

1. A ferroelectric material, comprising:

(a) A material composition of substituted $PbTiO_3$ with Ca substituted for Pb and Sn substituted for Ti as shown within the dashed-line region of Figure 4.

2. A ferroelectric material, comprising:

(a) $(Pb_{1-x}Ca_x)(Ti_{1-y}Sn_y)O_3$ with $0.15 < x + y < 0.4$ and $0.1 < y/x < 4$.

3. A ferroelectric material, comprising:

(a) a material of $(Pb_{1-x}Ca_x)TiO_3$ with x in the range of about 0 to 0.1; and

(b) a dopant of 1 % or less and selected from the group consisting of Dy, Ho, Bi, Ce, Fe, and mixtures thereof.

4. A method of fabrication of ferroelectric material, comprising the steps of:

(a) reacting metal organic compounds of lead, titanium, calcium, and tin in a solution to form a $(Pb_{1-x}Ca_x)(Ti_{1-y}Sn_y)O_3$ compound;

(b) rapid thermal annealing the compound of step (a) with a thermal budget of less than about 600 °C for 20 seconds, 575 °C for 45 seconds, 550 °C for 90 seconds, or 525 °C for 200 seconds.

5. The method of claim 4, further comprising the step of:

(a) adding a dopant of 1 % or less and selected from the group consisting of Dy, Ho, Bi, Fe, and mixtures thereof to the solution of step (a) of claim 4.

6. The material of claim 1, further comprising:

(a) a dopant of 5 mol% or less and selected from the group consisting of Mn, Dy, Bi, Y, Ho, Ce, Gd, Ga, Cd, Fe, and mixtures thereof.

7. The material of claim 2, further comprising:

(a) a dopant of 5 mol% or less and selected from the group consisting of Mn, Dy, Bi, Y, Ho, Ce, Gd, Ga, Cd, Fe, and mixtures thereof.

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